

FACTS

about pesticides



Ministry
of the
Environment

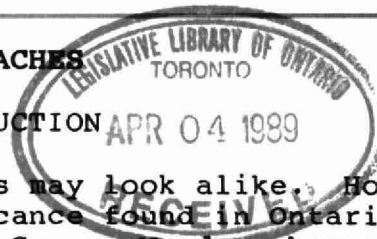
Hon. Jim Bradley
Minister

Gary S. Posen
Deputy Minister

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COCKROACHES

INTRODUCTION



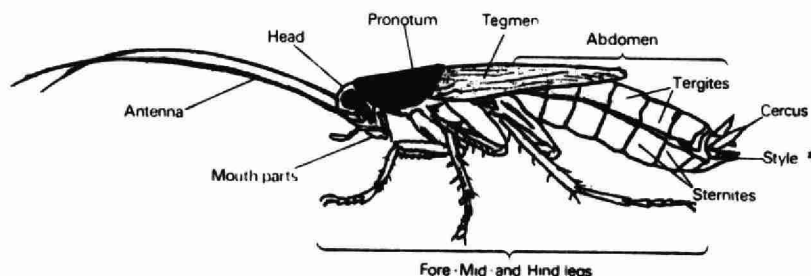
To the untrained eye, all cockroaches may look alike. However, there are actually five species of significance found in Ontario. German, Brown-banded, Oriental, American and Common Wood cockroaches are unwelcome pests in any home. The Australian and Surinam cockroach are also present in Ontario creating pest problems in greenhouses and atrium-like structures. The Asian cockroach, recently introduced into the southern U.S.A., has not yet been identified in Ontario. This cockroach is active during daylight and sunset hours, flies readily and is very similar in appearance to the German cockroach.

The main attractions for a cockroach are food, water and shelter. To them, almost anything is food - any foodstuff, paper, cloth, plants and even glue used for binding books.

They can be found in every part of the home, but most prefer some kind of damp environment. Since most cockroaches are active at night many people may be completely unaware of their presence in their home.

Cockroaches are a public health concern because they have been known to carry Salmonella bacteria - the organisms responsible for food poisoning.

Although some people worry that admitting to an infestation of cockroaches indicates poor housekeeping, at times even the most conscientious housekeeper may find it impossible to avoid an infestation. The attached pictorial key will help you to identify the species of cockroaches discussed in this factsheet. The diagram below outlines some common body parts used in identifying cockroaches.



* styles are present only on nymphs and adult males.

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IDENTIFICATION AND LIFE HISTORY

GERMAN COCKROACH (Blatella germanica)

The German cockroach is probably the most widespread species of cockroach in the world, having spread largely through the shipping of foods and other goods.

It is a small insect, 10 to 15 mm in length and is yellowish-brown in colour, with two distinctive dark parallel bands running the length of the pronotum (portion behind the head).

Eggs are laid in egg cases with about 38 eggs per case. The female drops each case close to food, just before the eggs hatch. She can produce up to seven of these cases in a lifetime. Under ideal conditions, incubation takes about 17 days and an adult can develop in six weeks.

The nymph (immature cockroach), moults or sheds its skin five to seven times before it reaches maturity. The life span of an adult is 125 to 150 days. In an average home, there can be two or three generations per year.

The German cockroach develops rapidly under suitable conditions, preferring a warm, moist environment. Consequently, it is frequently a pest in kitchens, food storage areas, and bathrooms. It feeds on a wide variety of stored food products as well as scraps of food which may have fallen undetected. Harbourage locations include crevices behind sinks, beneath service counters, under kitchen equipment, motor compartments, within electrical fuse boxes, inside telephones and under broken plaster.

BROWN-BANDED COCKROACH (Supella supellectilium)

The Brown-banded cockroach is similar in size to the German cockroach. The adult male is 13 to 14 mm long, while the female is 10 to 12 mm. The wings of the male completely cover the abdomen, whereas on the female the tip of the abdomen is exposed.

It is a brownish-buff colour with the face and the tip of the abdomen being chestnut brown to black. The lateral edges of the pronotum are transparent, the remainder is dark. The nymph and adult stages have two brown bands across the tegmina (wings). These bands, which are more noticeable on the nymph, are the main distinguishing feature between the German and Brown-banded cockroach.

The egg case holds about 16 eggs. It is small, reddish-brown in colour and purse-shaped. The female glues it to a hidden surface. The eggs take about 40 days to hatch and the insects moult six to eight times before reaching maturity. The adult may live for up to 4 months and there may be two generations per year.

Although the Brown-banded cockroach is nocturnal, it may often be seen during the day. It is capable of flight and can be found fluttering around lights in the house. It may be found throughout infested premises; however, it prefers to hide in crevices high up in heated

rooms where the average temperature is 26°C. Common harborage areas include: furniture, bedding, behind picture frames, in clothes cupboards, inside ceiling fixtures, in televisions and telephones, behind curtain pelmets, book shelves and behind wall paper. This cockroach commonly feeds on book bindings and wall paper pastes.

ORIENTAL COCKROACH (*Blatta orientalis*)

This species of cockroach is less wary and more sluggish than the others. It is very dark brown, almost black in colour and about 25 mm long. The tegmina of the male cover about three-quarters of the abdomen and are darker than the abdomen. On the female, the tegmina are only partially developed and they appear almost wingless. Neither male nor female can fly.

There are 16 eggs in an egg case and the female may deposit an average of 8 to 14 cases in her lifetime. They are dropped indiscriminately after formation. The eggs hatch in 60 days and the nymphs undergo seven moults before reaching maturity. They can live for up to two years.

This cockroach prefers dark, damp crevices in such places as basements, utility and service tunnels and sewer pipes. It can climb the outside of water pipes to reach the upper floors in buildings. Since the Oriental cockroach prefers to live in colonies, great numbers may occur around water leaks in the basement, behind toilets, baths or laundry tubs. Outdoors, when the climate is tolerable, this cockroach may be found in back lanes, under verandahs or among piles of garbage.

AMERICAN COCKROACH (*Periplaneta americana*)

The American cockroach is the largest of the common cockroaches- 30 to 40 mm long. It is a shiny reddish-brown colour with a paler yellow area around the edge of the pronotum. The fully developed tegmina extend well beyond the tip of the abdomen in the male, but only just overlap the abdomen of the female. This species can fly but flight is rare and sluggish.

Each egg case usually contains 16 eggs which are indiscriminately dropped by the female. The incubation period of the egg ranges from 24 to 60 days, depending on the temperature. After the young cockroach emerges, it undergoes seven to ten moults before reaching maturity. The adult life span can be up to two years, during which time the female can produce 10 to 15 egg cases.

The American roach prefers a warm moist environment and is frequently found on surfaces where food is stored or prepared in restaurants, bakeries, grocery stores, and other premises. Utility tunnels housing hot water pipes are also a preferred habitat of this cockroach.

COMMON WOOD COCKROACH (*Parcoblatta* sp.)

The Wood cockroach is chestnut brown in colour. It is normally an outdoor pest but can sometimes be found in homes and cottages. Its diet consists mainly of organic matter, sweet or fermenting substances and fungi, and it hides beneath loose bark, ground litter, in wood piles,

stumps and hollow trees. The males of the Wood cockroach are strong flyers and are often attracted to lights at night.

The males of the Wood cockroach are chestnut brown with the thorax and tegmina edged in a pale colouration. Males are larger (22-30 mm) than females (12-20 mm). P. pensylvanica is a common species in Southern Ontario, and noticeable differences in colouration occur from different locations in the Province. Egg cases are produced every 5 to 9 days; releasing 24-30 nymphs. Total life span (egg to adult death) is one year.

AUSTRALIAN COCKROACH (Periplaneta australasiae)

The Australian cockroach is becoming a more frequently encountered pest due to the increase in the importation of tropical plants for indoor malls, atriums and solariums. Zoos and greenhouses also experience problems with this cockroach damaging plants since it prefers a hot, moist environment. The Australian cockroach is a large cockroach (30-35 mm), slightly smaller than its cousin, the American cockroach. It is reddish-brown with tegmina that overlap the abdomen (both sexes). The pronotum has two distinct eye spots, surrounded by a pale edging. The tegmina have pale basal margins. Nymphs are specked with pale yellow spots on the thorax and abdomen. Females produce 20-30 egg cases every 10 days releasing 16-24 nymphs every 40 days. This cockroach prefers to hide beneath the bark of trees, under and between wooden posts or landscape timbers. Egg capsules are glued to leaves, bark crevices and brick or concrete walls.

SURINAM COCKROACH (Pycnoscelus surinamensis)

The Surinam cockroach has been introduced into Ontario as a greenhouse or tropical plant greenhouse pest. This cockroach is a soil dweller and quickly burrows into the soil if the ground litter in which it also hides is disturbed. They may also be found hiding beneath rocks, stones or wood.

Tropical-type environments (warm and humid) are preferred. Extensive damage to plants and root systems can occur in greenhouses in which this pest is established.

This cockroach is 18-24 mm in length with a metallic black or brown colouration. Males are extremely rare, if they exist at all. Adult females possess full tegmina extending beyond the abdomen. The pronotum possesses a pale band along the anterior margin of most adults. Females produce young without fertilization by males, a process called parthenogenicity. An egg case is produced; however, it is retained in the female in a brood sac giving rise to a false impression of the birth of live young. Females form three such egg cases in their life span, each containing 20 to 26 nymphs.

ASIAN COCKROACH (Blattella asahinai)

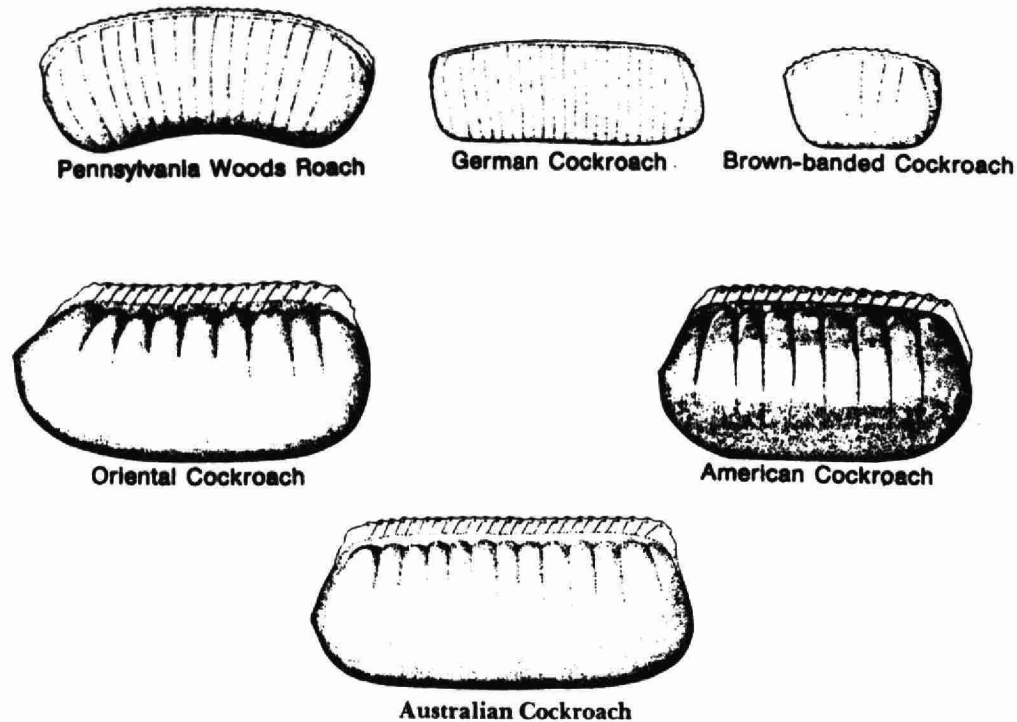
A new invader to North America, this cockroach strongly resembles the German cockroach, however, it behaves quite differently. The tegmina of the Asian cockroach are narrower and longer than the German cockroach

and are paler in colour. This cockroach readily flies and is capable of taking off from a horizontal surface in contrast to the German cockroach which normally obtains flight by gliding from above ground positions. The Asian cockroach will crawl quite rapidly as well. It is active outdoors moving to illuminated surfaces at sunset. Indoors this cockroach moves to lighted rooms to be discovered in moist areas in the morning.

Development from egg to adult is between 6-7 weeks with each egg case containing 38-40 eggs. The southeast U.S.A. is the present invasion site to date but, due to the active crawling behaviour of this cockroach passive transport to Ontario could occur.

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The following diagram demonstrates the variation in egg capsules of some of the cockroach species discussed above.



PREVENTION

Unfortunately, cockroaches have few natural enemies and if left alone can multiply very rapidly.

Good housekeeping will help to reduce the likelihood of a cockroach infestation. Always clean up any food or water spills and make sure food is kept in tightly-sealed containers. Try to inspect corrugated cardboard cartons and baskets, luggage, etc. entering your home; cockroaches can find many different ways of getting in. If there are any damp areas in your home, repair them - most cockroaches prefer dark, damp places such as under a sink, or behind counters, dishwashers, toilets and showers. Cockroaches will crawl into cracks and crevices where they are safe and protected. Since wooden surfaces are their favourite, they adapt well to modern kitchen and bathroom construction.

Glue boards and sticky traps are very useful in monitoring movement, population levels and key hiding places of cockroaches, although these should not be thought of as control methods.

It is recommended that an integrated approach be implemented when attempting a management program on either a small or large scale. Consult the Ministry of the Environment Factsheet "Integrated Pest Management for Structural Pest Control" for more information on this approach.

COCKROACH CONTROL

Cockroaches can best be controlled using an integrated approach. Applying stress to the cockroaches by denying them food, water or shelter, will result in a reduction in population.

Food reduction requires hygiene and sanitation. Obviously a knowledge of the food preferences of the particular cockroach involved will allow for specific changes to the infested site. Removal of food residues and regular cleaning will assist the control program.

Water is essential for all creatures, but it is difficult to make sure that there is none available when for example, condensation on water pipes can provide all the needs for a cockroach population inhabiting a building. Fixing leaks and adjusting humidity levels will obviously assist the control program.

Habitat modification is a major control procedure. Latex or acrylic caulking of crevices around plumbing and pipes, cupboards, utility outlets, sinks, toilets, cabinets, shelves, and counter tops will reduce hiding spaces for the cockroach.

The use of insecticides in an integrated program is necessary in some situations. The aesthetic abhorrence and psychological mental distress caused to homeowners, tenants or workers often requires the use of immediate control measures. Insecticides must be used with utmost care so that potential health risks are minimized.

Even when the correct insecticide is applied in accordance with label instructions, by a trained and licenced applicator, there may be complaints of odours. Very often these odours are due to solvents in the insecticide which many people erroneously assume indicates toxicity. Commonsense often suggests appropriate precautions; for example, an insecticide registered for cockroach control should not be used during the operating hours of a child's daycare centre. Neither should a kitchen be treated when it is being used to prepare food. Apply approved formulations with care and choose a type and formulation of insecticide that will create the least health concern and the minimal environmental risk. Some insecticides may not control cockroaches as effectively as others due to the treatment conditions.

CHEMICAL CONTROL

To control cockroaches, the insecticides listed on the following pages can be used.

USING PESTICIDES

All pesticides are toxic to some degree; however, they can be used safely and with minimal risk if handled properly, using proper protective clothing (e.g., rubber or neoprene gloves and other equipment as advised by label directions), and by following mixing and precautionary instructions on the label.

Here are a few application tips:

1. **READ THE LABEL CAREFULLY** before buying a pesticide and make sure the pest you are trying to control is listed on the label.
2. Remove pets, food, cutlery, dishes and pet dishes before treating any area. Advise all occupants to vacate the treatment area. After treatment of cupboards, cover shelves with shelf paper before replacing food or utensils. Allow three to six hours before re-entry to allow the solvent to disperse - ventilate the area well after spraying.
3. Always follow the label directions. When applying, do not spray the entire surface area where you have seen cockroaches; instead, concentrate on cracks, crevices, and spaces where they may hide.
4. Understand the properties (i.e., residual or non-residual, dust or liquid, etc.) of different insecticides; the most appropriate use for each formulation and under what conditions each is likely to perform the best.
5. When applying pesticides to chesterfields and chairs, apply only to seams or underside of cushions using a non-residual insecticide, eg. pyrethrin.
6. Aerosols containing pyrethrins can be used as a flushing agent to locate places where cockroaches are hiding. Pyrethrins irritate the cockroaches causing them to be flushed out of their hiding places.
7. Oil-based sprays may dull waxed or varnished surfaces. Washing or waxing after the chemical becomes ineffective (about three weeks after application), will usually return a shine to these surfaces.
READ PRECAUTIONS ON THE LABEL.
8. Diatomaceous earth is greatly reduced in effectiveness in moist locations (the area the German cockroach prefers) compared to boracic acid yet both are considered relatively low toxic materials.
9. Residual insecticides (i.e., remain active for several weeks) are practically useless in controlling cockroaches if applied to greasy walls or dirty cracks and crevices.

10. Store pesticides in a locked cupboard or container out of the reach of children and away from food and drink.
11. Do not place or transfer pesticides into containers that will attract children, e.g. soft drink bottles.
12. Wash with soap and water after using a pesticide.
13. Dispose of empty domestic pesticide containers in household garbage.
14. Qualified exterminators licensed by the Ministry of the Environment can be called for professional help - consult your Yellow Pages.

The following insecticides are registered for cockroach control:

Active Ingredient (Trade Name and Formulation)	Ontario Schedule	Application Dosage
Bendiocarb (Ficam W; Ficam Plus (Pyrethrin); WP)	2	0.25% or 0.50%
Bendiocarb (Ficam D;D)	3	1%
Borax (Boric Acid; D)	4	99%, 73%
Chlorpyrifos (Dursban, Fosban; EC)	6	
	3	0.24%, 0.48%
Dichlorvos (DDVP; EC)	3	0.9%, 1%
Dichlorvos (DDVP; F)	3	5%, 10%
	2	20%
Diazinon (Basudin FM; M)	2	0.25 - 1.0%
Diazinon (S)	4 & 6	1%
	6	0.5%
Diazinon (D)	3	2%
Pyrethrin & Silica Aerogel (Drione; D)	4 & 6	1% pyrethrin, 40% silica
Fenthion (S)	4	0.5%
Hydramethylnon (Maxforce) Impact: B)	6	1.65%
Malathion (S)	4	2%
Propoxur (Baygon; S)	4 & 6	1%
	6	0.5%
Propoxur (Baygon; B)	3	2%
Pyrethrins (S)	4 & 6	1%, 0.2%
	3	3%, 5%
Pyrethrins (D)	4	Less than or equal to 1%
Pyrethrins (Sectrol; M)	6	1.1%
Resmethrin (S)	4	0.05% - 2%
Ronnel (S)	4 & 6	1%, 0.1%, 2%
Silica Aerogel (D)	4 & 6	40%
Sodium Fluoride (D)	2	10%
	1	27%, 39%, 70%, 80%, 95%

NOTE:

Pesticide scheduling is based on toxicity, container size and other variables. A tenant or homeowner can apply Schedule 3, 4 or 6 pesticides in their own premises without requiring an exterminator's licence. A landlord or building superintendent can apply Schedule 4 and 6 pesticides in non-rented suites and common areas without requiring an exterminator's licence. A structural exterminator's licence is required for a landlord or superintendent to apply pesticides in occupied suites. Use of schedule 1 and 2 pesticides are restricted to licensed exterminators.

S - solution
D - dust
B - bait

F - fumigant
WP - wettable powder

M - microencapsulated
EC - emulsifiable
concentrate

This publication has been reviewed by the Ontario Pesticides Advisory Committee.



**PESTICIDES ARE POISONS –
TREAT THEM AS SUCH**

A Pictorial Key to the Cockroaches of Ontario

